

CLAIMS

1. Distribution valve with flow meter, in particular for the use in the inlet of a hot water heating circuit, with a housing (3) forming the inflow conduit, a branch line (2) extending from the housing (3) and an adjusting and measuring unit (1) formed separately from the housing (3) and arranged at the housing (3) opposite the branch line (2) and penetrating the housing wall, for the adjusting and displaying of a flow rate of a medium flowing through the branch line (2), wherein the adjusting and measuring unit (1) comprises a valve closing body (5), which is operatively connected to an adjusting spindle (4) in such a manner that it forms together with a valve seat body (6), which during conventional operation is stationary relative to the housing (3), a valve gap, which is adjustable by a rotating of the adjusting spindle (4) for the adjusting of the flow rate, and wherein the adjusting and measuring unit (1) includes a flow against member (7), which is located in a flow channel (10), through which in operation substantially the complete medium flowing off through the branch line (2) flows, wherein the position of the flow against member (7) in the flow channel (10) is adjustable beginning from a starting position by a flow which flows from the valve gap to the branch line (2) dependent from the flow rate, and wherein the flow against member (7) is operatively connected to display means (9, 11, 12) of the adjusting and measuring unit (1), which may be read off from the outside, in such a manner that different positions of the flow against member (7) in the flow channel (10) cause different displays of the display means (9, 11, 12), wherewith the respective flow rate through the branch line (2) can be read at the valve at its outside,

characterized in that the distribution valve is designed in such a manner that the flow exiting the valve gap during conventional operation is deflected prior to its impinging onto the flow against member (7) at least twice, in particular in each case by at least 45°, in particular in each case by about 90°, namely initially by a first sense of rotation in a first direction and thereafter by a second sense of rotation opposed to the first sense of rotation in a second direction.

2. Distribution valve with flow meter, in particular according to claim 1, in particular for the use in the inlet of a hot water heating circuit, with a housing (3) forming the inflow conduit, a branch line (2) extending from the housing (3) and arranged at the housing opposite the branch line (2) and penetrating the housing wall for the adjusting and displaying of a flow rate of a medium flowing through the branch line (2), wherein the adjusting and measuring unit (1) comprises a valve closing body (5), which is operatively connected to an adjusting spindle (4) in such a manner that it forms together with a valve seat body (6), which during conventional operation is stationary relative to the housing (3), a valve gap which is adjustable by a rotating of the adjusting spindle (4) for the adjusting of the flow rate, and wherein the adjusting and measuring unit (1) includes a flow against member (7), which is located in a flow channel (10) through which in operation substantially the complete medium flowing off through the branch line (2) flows, wherein the position of the flow against member (7) in the flow channel (10) is adjustable beginning from a starting position by a flow which flows from the valve gap to the branch line (2) dependent from the flow rate; and wherein the flow against member (7) is operatively connected to display means (9, 11, 12) of the adjusting and measuring unit (1)

which may be read from the outside in such a manner that different positions of the flow against member (7) in the flow channel (10) cause different displays at the display means (9, 11, 12), wherewith the respective flow rate through the branch line (2) can be read at the valve at the outside, characterized in that a housing section (13) of the adjusting and measuring unit (1), which is stationary during conventional operation of the distribution valve, sealingly contacts, in particular at the face end by sealing surfaces and/or by a seal (14), a housing portion of the branch line (2) which is stationary during the conventional use of the distribution valve.

3. Distribution valve according to claim 2, characterized in that the structural member, which forms the walls defining the flow channel (10) at least in the area in which the flow against member (7) can be positioned by the flow during conventional operation, is arranged at least in part inside of the stationary housing section (13) of the adjusting and measuring unit (1), and that this structural member and the stationary housing section (13) are designed in such a manner and/or sealing elements (16) are arranged between them in such a manner, that a forming of a leakage flow from the valve gap to the exit of the branch line (2) by bypassing the flow channel (10) is reliably prevented.

4. Distribution valve according to one of the claims 2 to 3, characterized in that the stationary housing section (13) of the adjusting and measuring unit (1) comprises radial or half-axial throughflow openings (15), in particular of a circular or square shape, through which the medium can flow from the inflow conduit to the valve gap.

5. Distribution valve according to one of the preceding claims, characterized in that the valve seat body

(6) is formed by a structural member (13) of the adjusting and measuring unit (1).

6. Distribution valve according to one of the preceding claims, characterized in that the walls defining the flow channel (10), at least within the area in which the flow against member (7) can be positioned by the flow during the conventional operation, are formed by a housing section (13) of the adjusting and measuring unit (1).

7. Distribution valve according to one of the preceding claims, characterized in that the structural member, which forms the walls defining the flow channel (10), at least in the area in which the flow against member (7) can be positioned by the flow during conventional operation, projects into the branch line (2), and in particular that this structural member and the branch line (2) are designed in such a manner and/or sealing elements (16) are present between them in such a manner, that a formation of a leakage flow from the valve gap to the exit of the branch line (2) reliably is prevented.

8. Distribution valve according to one of the preceding claims, characterized in that the distribution valve is designed in such a manner that the flow flowing during conventional operation from the valve gap to the flow channel (10) enters the flow channel (10) through several radial openings (18) in the wall of the flow channel (10) ahead of the flow against member (7) seen in the direction of flow.

9. Distribution valve according to claim 8, characterized in that the radial openings (18) are respectively uniformly distributed, in particular along a common axial position, at the circumference of the flow channel (10), and in particular that all openings (18) have an identical cross-section and/or an identical shape.

10. Distribution valve according to one of the claims 8 to 9, characterized in that exactly two or exactly four radial openings (18) are present.

11. Distribution valve according to one of the preceding claims, characterized in that the distribution valve is designed in such a manner that the valve gap is formed by a concentric immersion, in particular in the direction of the through flow (S) of the branch line (2), of a conically shaped body of the valve closing body (5) into a in particular cylindrically shaped bore of the valve seat body (6), so that the valve gap, seen in the direction of flow, is a circular ring shaped gap of which the width of the gap decreases with a increasing immersing of the valve closing body (5) into the bore of the valve seat body (6) until it has a minimal value or amounts to zero.

12. Distribution valve according to one of the preceding claims, characterized in that the cross-section of the flow channel (10) broadens in the direction of flow in the area in which the flow against member (7) may be positioned at conventional operation by the flow flowing in same, and in particular in that the flow channel (10) is conically shaped in this area.

13. Distribution valve according to one of the preceding claims, characterized in that the adjusting spindle (4), the valve closing body (5) and the flow channel (10) are formed by an one-piece component which in particular is an one-piece injection molded part of a plastic material.

14. Distribution valve according to one of the preceding claims, characterized in that the display means (9, 11, 12) comprise a display rod (9), operated by the flow against member (7) having in particular a display marking, and an adjusting member (11) for a manual operating of the adjusting spindle (4), which completely encloses the outwards

oriented free end of the display rod (9) and is at least partly transparent, and in particular is equipped with a scale for allowing a reading off of the respective position of the display rod and thereby of the flow rate through the branch line (2).

15. Distribution valve according to claim 14, characterized in that the adjusting member (11) is rigidly connected to the adjusting spindle (4), and in particular that the adjusting spindle (4) and the adjusting member (11) are formed by a one-piece component, in particular of a transparent plastic material.

16. Distribution arrangement, comprising at least two distribution valves according to one of the preceding claims.

17. Adjusting and measuring unit (1) for the distribution valves or the distribution arrangement according to one of the preceding claims.